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ABSTRACT

The purposes of this article are (1) to report empirical findings of studies of original or creative thinking in preschoolers, (2) to point out important issues to be considered in measuring the creativity of preschool children, and (3) to discuss the practical implications of these findings and issues. Research conducted at the Virginia Polytechnic Institute and State University indicates that the creativity of preschool children can be measured independently of the factor of intelligence. Results of recent studies of preschoolers' creativity have indicated that the quantity of ideational output is related to its quality, that in contrast to two-dimensional stimuli three-dimensional stimuli elicit a greater number of responses, and that more familiar (or "hands on") stimuli elicit more reponses than less familiar stimuli. Issues to be considered in measuring creativity pertain to the task setting, examiners, stimuli, and age and individual differences. Care must be exercised in controlling the uniformity of the task setting, in the selection of items, and in the use of a proper normative group. It is concluded that the findings obtained thus far may support the view that current socialization practices, particularly those of schools, stifle children's creative potential. (RH)

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Measuring Creativity in Preschool Children

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Measuring Creativity in Preschool Children

Although research on creativity has substantially increased during the past two decades (Barron & Harrington, 1981), work with preschoolers has remained relatively sparse (Arasteh & Arasteh, 1976). The lack of research on younger children exists in spite of, or perhaps because of, the belief among many authors (e.g. Anderson, 1959) that creativity is "natural" among preschoolers.

Creativity may be defined as the generation of products which are unusual, of high quality, and socially useful. This definition precludes creative behavior in children if "socially useful" is interpreted as behaviors judged to be genuinely significant by the stringent standards of adult society. One of the reasons why researchers have devoted little attention to creativity in preschool children, may be the belief that truly creative behavior is not possible at this age. The artwork of a 4-year-old may be "cute," but is it not considered to be creative in the same sense that significant contributions to society such as the designing of a skyscraper. On the other hand, young children in their everyday activities do exhibit behaviors which are unusual, of high quality and socially useful within the context of the child's world.

The development of adequate measures of creativity in preschoolers is important for two major reasons: (1) to put the view widely accepted in early childhood education, that creativity is natural in young children to an

empirical test; and (2) to contribute the information required for the formulation of a theoretical model of creativity which takes into account developmental issues such as stability and continuity.

At the Virginia Polytechnic Institute and State University the present authors conducted several studies of original or creative thinking in preschoolers. The findings of these studies are reported in detail elsewhere (Moran, Milgram, Sawyers & Fu, Note 1; Note 2; Sawyers, Moran, Fu, & Milgram, Note 3). The goals of the current article are: (1) to bring the empirical findings of our studies cited above to the attention of those interested in creativity among young children; (2) to report some important issues to be considered in measuring of creativity in preschool children as evident to date; and (3) to discuss the practical implications of these findings.

Summary of Studies of Original Thinking in Preschoolers

Our work so far has utilized ideational fluency as the primary measure of creativity with items adapted from the work of Starkweather (1971), Wallach and Kogan (1965) and Ward (1968). Ideational fluency has been cited by numerous theorists as an essential component in the process of creative or original problem solving (Guilford, 1956, 1967; Mednick, 1962; Wallach & Kogan, 1965). These theorists contend that there is a relationship between the quantity of response and its quality such that the generation of many potential solutions leads to the production of a few highly original solutions (i.e., statistically unusual and of high quality). Although we recognize

that creativity is composed of other cognitive as well as personality factors, we have started with ideational fluency because it has received more attention than any other component of creativity and most creativity instruments use ideational fluency as the major variable (Getzels & Jackson, 1962; Torrance, 1974; Wallach & Kogan, 1965).

Starkweather (1964) noted the special problems that exist in the measurement of creativity in preschool children and that researchers are often not sensitive to the young child's view of the world. A recent study of 47 (mean age = 4-6) preschool children (Moran, Milgram, Sawyers & Fu, Note 1), however, demonstrated that the Guilford-Mednick conceptualization that ideational fluency is an essential component of original thinking is as applicable to preschool as to older children. Original thinking as measured by Wallach and Kogan Creativity Battery was shown to be distinct from intelligence as measured by the Wechsler Preschool and Primary Scale of Intelligence. Quantity of ideational output was related to its quality. A strong order effect, i.e., popular responses occurring earlier and original responses later in the response sequence, was evidenced. This finding is congruent with Mednick's (1962) proposal that the first responses to a stimuli are generally the popular, more mundane ones and the original, creative responses, typically appear later in the response hierarchy.

Starkweather (1964, 1971) also suggested that some of the materials used in studies of original thinking at older age levels (Wallach & Kogan, 1965; Torrance, 1974; Ward, 1968) are inappropriate for preschoolers. This is because they are usually two-dimensional and do not permit the children to

handle the materials. Starkweather (1971) developed a measure consisting of sample three-dimensional styrofoam shapes. We conducted a study (Moran, Milgram, Sawyers, & Fu, Note 2) comparing three-dimensional stimuli with two-dimensional representation of these stimuli. Two dimensional stimuli are typically used with older children (Torrance, 1974) and have also been used with preschoolers (Busse, Blum, Gutride, 1972; Ward, 1968). The three-dimensional tasks generated a greater number of responses than the two-dimensional ones. Moreover, scores on the three-dimensional tasks were distinct from intelligence whereas those on the two-dimensional were not. The findings of our study, using three-dimensional stimuli, support the Starkweather position and demonstrate the importance of developing measures of original thinking which are appropriate for preschool children. This issue is also relevant with regards to the stimuli on the uses task. In another study (Sawyers, Moran, Fu, & Milgram, Note 3) we found that stimuli assumed to have a greater "hands on" familiarity to preschoolers elicited more responses than did stimuli with less familiarity. We believe that special care must be taken to ensure that stimuli are appropriate for preschool children. Only in this way, can an adequate sampling of response hierarchies and discrimination of high vs. low creative children be obtained.

Children's Responses

The four-year-old children in our studies gave responses which were original and of high quality. A few examples may help to illustrate and to entertain.

The 3-D patterns stimulus, which is presented in Figure 1, elicited popular responses such as hammer, bed, gun, the letter L and the number 1. This stimulus to some children, however, was "Snoopy laying down," "terror from the deep" (i.e., a monster) or "Winnie-the-Pooh's foot." Not only were these responses original but they also give evidence of a high degree of imagery. The 2-D patterns stimulus presented in Figure 1 was seen by many children to be a rainbow, a bridge, a tunnel or the letters C and U. It is interesting to note the frequency with which letters and numbers were popular responses to these patterns stimuli. Original responses to this stimulus included a dead fish, the neck of a shirt, a telephone without the cord, and "a smile on a holiday with blue lipstick on." This latter response clearly structures the imagery to fit the blue color on the stimulus.

Insert Figure 1 about here

Responses in the uses and instances tasks were no less fascinating. The stimulus of a box which was most typically used as some kind of container was also seen as an ashtray, a playpen or a tent. Apples, coats, hearts, cardinals and wagons were all common things that are red. Also included in this category, however, were a sunburn, chicken pox, cold hands and a "fireman painting a picture of himself."

Issues to be Considered in Measuring Creativity

In this section we will present our findings of some important differences between the measurement of creativity in preschool and older children. The issues to be considered will be presented in terms of task setting; examiners; stimuli; age differences; and individual differences.

Task setting. We noticed that the physical setting of the test administration was important. Children would often look about the room for responses. Thus, for example, on items such as "things that are red" children tested in the school storeroom gave different kinds of responses than children tested in the more austere laboratory space. This demonstrates the necessity of controlling for extraneous stimuli and perhaps to develop local norms for responding.

Examiners. Selection and training of examiners also are crucial as in any assessment using individual administration. Some examiners seemed to be more skilled at establishing rapport and thus eliciting more responses from these young children than were others. One way to improve child-examiner rapport is to encourage the examiners to spend some time with the children prior to actual testing. This will increase familiarity and enhance interaction between the children and the examiner.

Stimuli. The stimuli for the instances task asked the child to list all of the things that are round, red and make noise. On the uses task children were asked to list all of the things you could use a spoon, paper and a box for. The patterns tasks, consisted of both two- and three-dimensional representations of the forms used by Starkweather (see Figure 1). Upon investigation of the tasks used in our research several points were immediately evident to us. The uses task elicited the fewest responses overall. It is work noting that Busse, Blum and Gutride (1972) had difficulties administering this task

to 4-year-olds, although Ward (1968) was successful with slightly older children. Perhaps the problems with this task were due to the young child's difficulty in comprehending function and the possibility they are bound by the concreteness of stimuli. For example, the stimulus item "spoon," elicited the fewest responses overall. This may have been due to its restricted range of variation, when compared to other stimuli (e.g. box or paper). It also appears that the three-dimensional patterns task serves as a better measure of creativity at this age than the two-dimensional task. The 3-D task elicits more responses. This could be because 3-D items are less abstract, thus offer more concrete perspectives to preschoolers. For children of this age this may be crucial. Furthermore, 3-D items have low correlations with intelligence. These points are discussed in more detail in another paper (Moran, Milgram, Sawyers, & Fu, Note 2).

As a result we believe the items selected for the uses and instances tasks in further study need to be familiar to preschool children, while being abstract enough to allow flexibility in thinking. In addition, we recommend that children be allowed to manipulate the stimuli, preferably in 3-D form.

Age differences. We have not as yet conducted developmental research. However, our findings when compared to existing data, demonstrate interesting developmental trends. Preschoolers generate a larger percentage of original responses (60.1) than do children who are considerably older. The corresponding percentages for second-graders through adolescents are 25-33% (Milgram, Note 4; Milgram,

Milgram, Rosenbloom & Rabkin, 1978; Milgram & Rabkin, 1980). Only the percentage of original responses for young adults (52.3) approached that of preschoolers (Miglram & Arad, 1981).

This trend could be attributed to the socialization processes of society (i.e., schooling) which may lead to more cautious responding throughout middle childhood. On the other hand, it may reflect a developmental pattern in cognitive functioning which parallels U-shaped curves on other cognitive tasks (Strauss, 1981). Research of a developmental nature is needed in order to address these issues with more confidence. Based on our data, we also believe that these responses were age dependent and that norms determining the level of originality of responses should be developed at each age level. A normative group should be reflective of developmental changes in response patterns.

Individual differences. On this type of tests, not every child was capable of generating original, high quality responses, nor did every child demonstrate "spontaneous, natural" creative abilities. In fact, on each item one or two children stood out from the rest as distinctly different. Thus, individual differences seem to exist in creative ability by age four.

Conclusion and Implications

Our research has led us to the conclusion that creativity can be measured in preschool children as distinct from intelligence. However, care must be exercised in the uniformity of the task setting, in the selection of items, and in the use of proper normative group. Although we believe it is possible to measure creativity at this age, it appears to us that many current measures

are focusing too narrowly on ideational fluency alone. We are currently testing a model that incorporates other cognitive skills as well as personality traits into a unified concept of creativity.

Our data also show that preschool children are capable of original, high quality (i.e., creative) responses on ideational fluency tasks. This does not imply that creativity is "natural" in preschoolers (at least no more so than intelligence is "natural" in preschoolers). Creativity is a cognitive ability which is probably distributed in the preschool population much the same as intelligence and other cognitive abilities. Most children are grouped around the mean, with a few children standing out from the crowd. The suggestion of a U-shaped developmental trend in the percentage of original responses merits more investigation. Our findings so far may give some support to the view that creative potential is stifled by current socialization practices, particularly in schools. On the other hand, they may be indicative of changes in cognitive style which occur with age. Further research will tell us which of these explanations is more tenable.

Although the need to design more and valid instruments for the study of creativity in preschoolers is important, the development of a more adequate theory of creative behavior is even more critical. It is the development of a theoretical model which will guide educators in helping each child utilize all of his or her creative potential.

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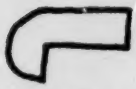
Figure Caption

1. Sample items used for two- and three-dimensional patterns tasks.

Figure 1

Sample Stimuli

3-D



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